

ESTABLISHED 1847

Carton Furnaces



FOR HOT AIR
AND COMBINATION

THE CARTON FURNACE CO.
UTICA, N.Y.

*Catalogue and
Price List.*

*Established
1847.
Makers of Heating Apparatus
for the past
50 Years.*

CARTON

Hot Air and Combination

FURNACES.

Manufactured by

*The Carton Furnace Company,
Utica, N. Y.*

Officers :

*EDWARD A. CARTON,
President and General Manager.*

*WILLIAM J. CARTON,
Vice-President and Treasurer.*

JOHN B. JONES, Secretary.

*Offices and Salesroom,
187 and 189 Genesee Street.*

*Foundry,
12 to 46 Carton Avenue.*

Introduction.

Experience is said to be the best and wisest of teachers. Our business was established in 1847, and with a knowledge embracing fifty years (half a century) in the manufacture of heaters, we feel entitled to the confidence of the trade. In presenting our fiftieth annual catalogue and price-list we earnestly solicit a careful examination of the heaters we manufacture. In the past year we have, at great expense, remodeled and perfected our different constructions of heaters, retaining all the valuable distinctive features that have made the "Carton" heaters so popular in the past fifty years, and in their improved construction we present the largest variety, most complete lines of sizes, and most perfect constructions on the market—heaters to meet the demands of all. We guarantee all of our heaters to be made of the best materials, and perfect in workmanship.

These goods are manufactured under our personal supervision, and thorough attention is given to every detail of their construction.

Respectfully,

The Carton Furnace Company.

To the Trade.

All heaters are sold F. O. B. (free on board cars) Utica, N. Y. We allow no freight. All heaters are shipped at owner's risk, on what are termed "released freight rates" (unless specially specified in the order to the contrary), in order to secure the lowest rates of freight, and, when we make delivery in good order to the transportation company and obtain their receipt, the goods become the property of the consignee, and any claims for damages or loss incident to their delivery must be made on them. All claims for correction of any nature must be made within ten (10) days from receipt of goods. In the absence of definite shipping directions, we will send by regular route. We positively refuse to ship goods on "consignment" or "on sale." We make shipments only on positive sales. Orders through our traveling representatives must state all conditions and agreements, and must bear the purchaser's signature. No verbal agreements recognized. Goods must not be returned to us without our consent; and when returned on these conditions, if in good order, will be credited at ten per cent. (10%) less than the purchase price, and with expenses deducted. In furnishing castings to replace breakages in transit we will make a charge of one-half price.

To avoid any unnecessary delay by correspondence, let your order be explicit, particularly so in ordering repairs, giving the number, series, and latest date on the heater. In ordering casing, state whether hot air pipes are to be taken out of the top or out of the side.

We recommend the former, if there is sufficient height of cellar. State what kind of fuel to be used,—hard or soft coal, coke, or gas.

Address all correspondence to home office, Utica, N. Y.

Terms of Payment.

Terms of sale, net cash thirty days, unless otherwise agreed. Repairs, strictly net cash. Interest will be charged upon invoices after maturity.

Carton "A" and "B" Series

Hard and Soft Coal Furnaces.

Solid, Substantial, and Economical Heaters.

The Two Radiators.

A very particular and distinctive feature in the construction of the two radiators of these furnaces is that not a square inch of their radiating surfaces is overshadowed from the direct radiant rays of heat from the surface of the fire. Every square inch of the enormous amount of radiating surface is absolutely fire surface. This insures the radiating surface being sharp, quick, and effective. On account of the large diameter of the radiators, and large area of air flues between the vertical combustion flues, fully 90 per cent. of the air in the hot air chamber is trench-plated at the top of the top radiator and drawn through the air flues to the center of the furnace, between the radiator and the gas dome. This insures a continual flow of warm air, under any conditions of the fire; more perfectly heats the air; the fire can be run under slower combustion for a given amount of heat required; prevents a rapid passage of air passing the radiator, entering the hot air pipes cold, and necessitates less care in the regulation of the cold air box damper. Each of these radiators is built in one solid piece of casting, no bolts being used in their construction. The radiators can be turned in any position, so the smoke pipe can be taken off the furnace at any point of its circumference.

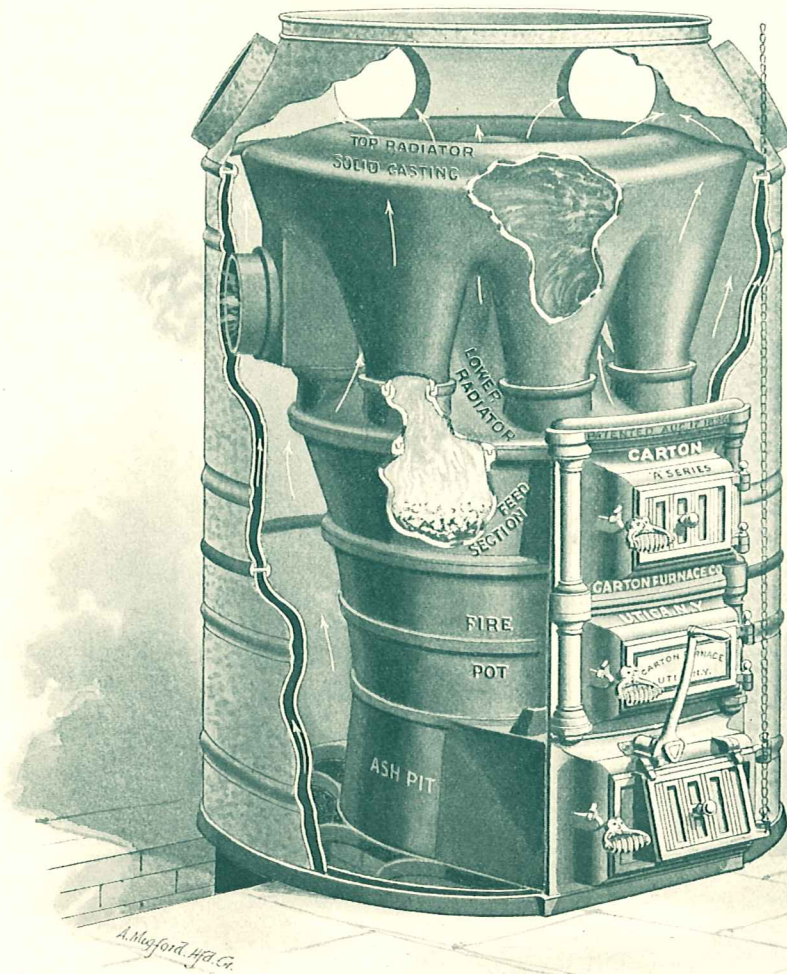
The Durability of Grates

Is insured by ample depth of ash pits.

Seven Sizes, Portable.

Designating Number, "A" Series.	List Price, Castings, F. O. B. Utica.	Double Castings, F. O. B. Utica, Net.	Diameter of Fire Pot, Inside. Inches.	Diameter of Casing. Inches.	Diameter of Radiator. Inches.	Diameter of Smoke Pipe. Inches.	Height of Castings. Inches.	Capacity. Number of Pipes of Average Size.
236	\$188.00	\$7.00	20	36	31	7	48½	4 to 5
240	216.00	8.00	22	40	34	7	49½	5 to 7
242	253.00	9.00	24	42	36	7	52½	6 to 8
246	300.00	10.00	26	46	39	8	58	7 to 9
252	366.00	11.00	28	52	45	8	64½	9 to 11
256	469.00	13.00	30	56	49	9	67½	10 to 12
260	610.00	15.00	33	60	52	9	72	12 to 15

See table, page 39.



**"A" Series
Carton Furnace.**

**Portable.
Hard Coal.**

The Combustion Flues

On account of their position, on the extreme outside edge of the radiators, compel all the combustion to impinge closely upon the surface of the castings. Their form is such as to give very liberal flue capacity, and yet to depress or retard the rapid escape of the gases before being perfectly consumed. On account of the bottom of these flues being directly over the fire, and in no way overshadowed or obstructed, and on account of their form at the top, the flues and radiators are made

Self Cleaning.

There are no pockets or projections in this furnace for the accumulation of soot, and the intense heat of the products of combustion passing through these flues prevents, to a large extent, any accumulations adhering to the vertical surfaces of the flues and radiators. The return flue box, to which the smoke pipe attaches, is a part of the top radiator. No loose connections, and there is no possibility of escape of gases at this point when draft in smoke pipe is checked.

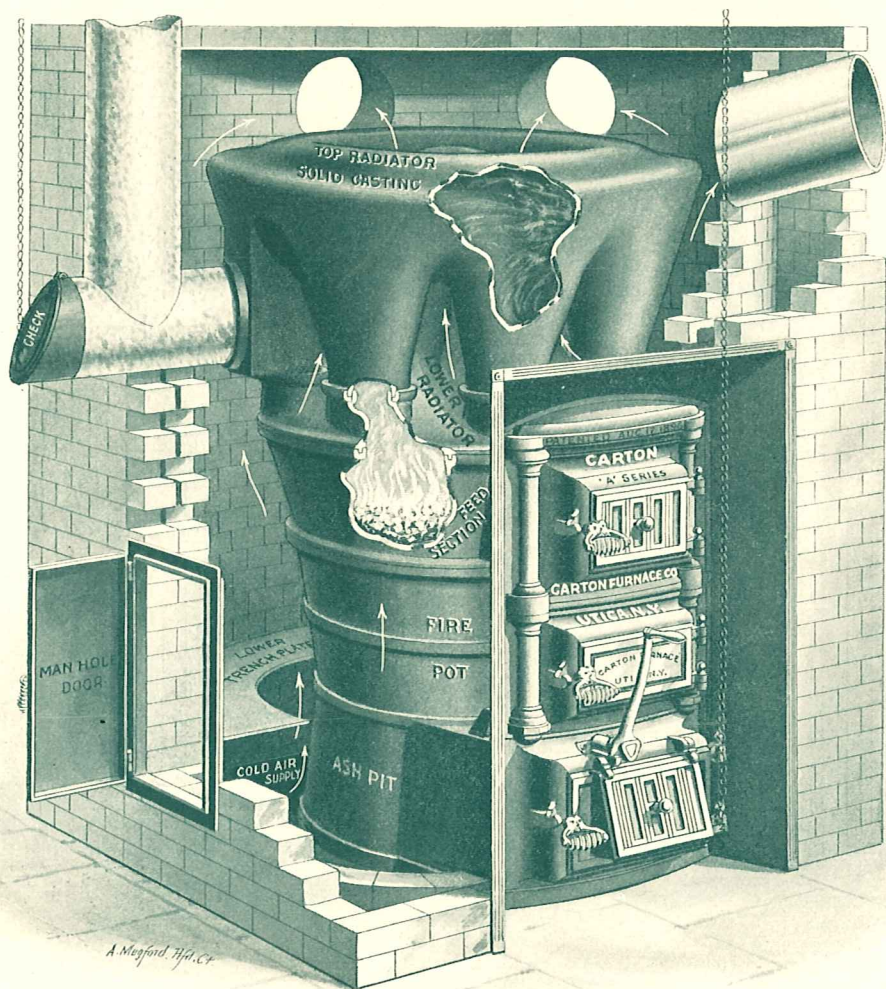
Combustion Chamber.

The construction of this heater gives a particularly large combustion chamber, a special feature of these heaters, insuring perfect combustion of the gases, and getting the fullest benefits of the fuel consumed.

Seven Sizes, Brick Set.

Designating Number, "A" Series.	List Price, Castings, F. O. B. Utica.	Covering Bars, Per Set, Net.	Trench Plates, Per Set, Net.	Diameter of Fire Pot, Inside. Inches.	Diameter of Radiator. Inches.	Diameter of Smoke Pipe. Inches.	Height of Castings. Inches.	Capacity. Number of Pipes of Average Size.
236	\$198.00	\$2.75	\$2.25	20	31	7	48½	4 to 5
240	226.00	3.00	2.50	22	34	7	49½	5 to 7
242	268.00	3.00	2.50	24	36	7	52½	6 to 8
246	315.00	4.00	2.75	26	39	8	58	7 to 9
252	386.00	4.00	3.00	28	45	8	64½	9 to 11
256	489.00	5.00	4.00	30	49	9	67½	10 to 12
260	635.00	6.00	5.00	33	52	9	72	12 to 15

See table, page 39.

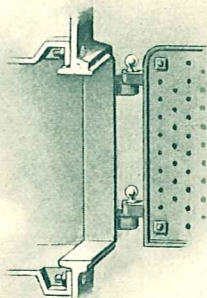


"A" Series
Carton Furnace.

Brick Set.
Hard Coal.

Doors.

The sectional illustration below shows the feed door boltings and expansion flange on frame, used on Series "A" to "F", inclusive.



There are four bolts used, one in each corner. This binds the door firmly to the feed section and removes any possibility of the door becoming loose, and thereby causing escape of gases on the inside of the top of door frame when furnace draft is checked. The expansion flange on the feed door frame provides for expansion of feed door and against any leakage of gases. The door always fits perfectly in this construction. The doors and frames form a handsome design shield front, very easily set up, and requiring but a few moments to attach them. No bolts are used in attaching shield front to casing, but a perfectly tight connection is made by the casing being set tight between door frames and mouthpieces of castings.

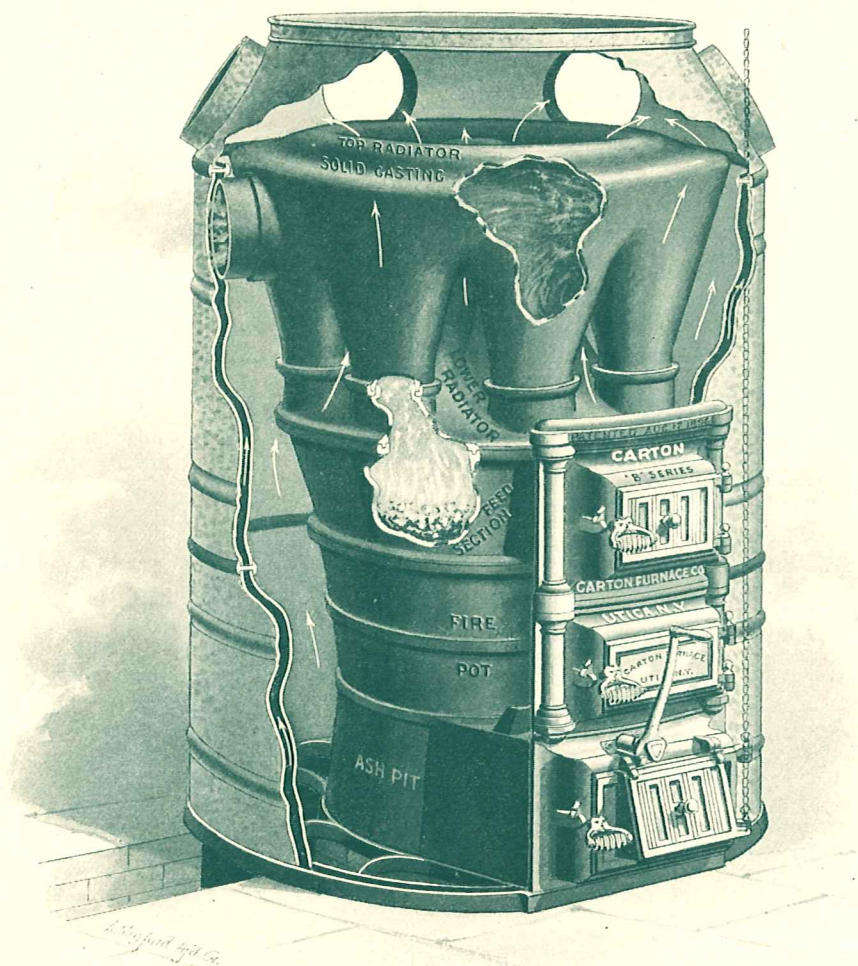
Ash Pits.

The ash pits have been made deep and the ash doors large.

Seven Sizes, Portable.

Designating Number, "B" Series.	List Price, Castings, F. O. B. Utica.	Double Casings, F. O. B. Utica, Net.	Diameter of Fire Pot, Inside, Inches.	Diameter of Casing, Inches.	Diameter of Radiator, Inches.	Diameter of Smoke Pipe, Inches.	Height of Castings, Inches.	Capacity. Number of Pipes of Average Size.
0236	\$188.00	\$7.00	20	36	31	8	48½	4 to 5
0240	216.00	8.00	22	40	34	8	49½	5 to 7
0242	253.00	9.00	24	42	36	8	52½	6 to 8
0246	300.00	10.00	26	46	39	9	58	7 to 9
0252	366.00	11.00	28	52	45	9	64½	9 to 11
0256	469.00	13.00	30	56	49	10	67½	10 to 12
0260	610.00	15.00	33	60	52	10	72	12 to 15

See table, page 39.



*"B" Series
Carton Furnace.*

*Portable.
Soft Coal.*

Fire Pots

Are made deep, straight, and no ashes can accumulate on the sides. They are constructed in two pieces, the division being at the center, with a deep cup joint; this joint allows the pot to expand and contract at the very point where required. Some of the "Carton" fire pots have been in use for thirty years without giving out. This is not a theory; it is experience, and not an experiment.

Construction of Expansion Joints.

The top and lower radiators and feed section, constituting the larger proportion of the radiating surface, are made up in three pieces of heavy, solid castings, and all the connections are made by deep cut expansion cup joints, which are perfectly gas-tight. At the connection of the two radiators are expansion cup rings, thereby providing for the exceptional expansion of these two parts. On all these expansion cup connections, on all our furnaces, the projections are on the outside of the heater; the inside surfaces of the furnaces present perfectly smooth surfaces, which adds greatly to the durability of the parts.

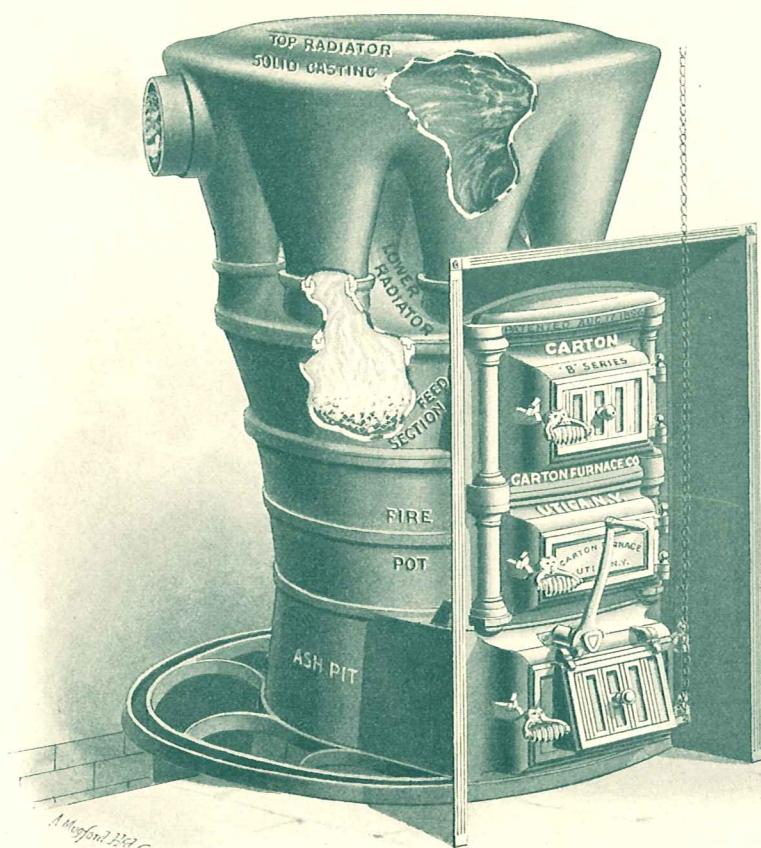
Casings

Are constructed double, the base ring being a perforated ring, allowing a circulation of air between the two casings, and discharging into the top of hot air chamber.

Seven Sizes, Brick Set.

Designating Number, "B" Series.	List Price, Castings, F. O. B. Utica.	Covering Bars, Per Set, Net.	Trench Plates, Per Set, Net.	Diameter of Fire Pot, Inside. Inches.	Diameter of Radiator. Inches.	Diameter of Smoke Pipe. Inches.	Height of Castings. Inches.	Capacity. Number of Pipes of Average Size.
0236	\$198.00	\$2.75	\$2.25	20	31	8	48½	4 to 5
0240	226.00	3.00	2.50	22	34	8	49½	5 to 7
0242	268.00	3.00	2.50	24	36	8	52½	6 to 8
0246	315.00	4.00	2.75	26	39	9	58	8 to 9
0252	386.00	4.00	3.00	28	45	9	64½	9 to 11
0256	489.00	5.00	4.00	30	49	10	67½	10 to 12
0260	635.00	6.00	5.00	33	52	10	72	12 to 15

See table, page 39.



*"B" Series
Carton Furnace.*

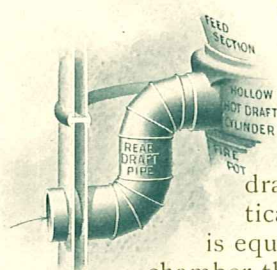
*Brick Set.
Soft Coal.*

Carton "C" Series

Soft Coal Smoke Consuming Furnace.

This heater is the same, with the exception of the smoke consumer attachment, as our Carton "B" Series, and detail description is the same as that of the Carton "A" and "B" Series on pages 4, 6, 8, and 10.

To consume the large volume of smoke and gases generated from soft coal fuel, we have in our Carton "C" Series made provision for introducing a large volume of hot air into the combustion chamber, the entire circumference of the same at a point where the gases and smoke are liberated from the fuel. To heat



this air to a high degree, we introduce the air into the combustion chamber indirectly through the draft door in the front of the heater. The air is drawn into the hollow hot-draft cylinder from the draft box through two vertical draft pipes, thereby practically heating the air before it enters the cylinder, and is equally distributed around both sides into the combustion

chamber through circular openings in the inner wall of the hollow hot-draft cylinder. To preserve the life of this cylinder, we provide a circular opening in the back of same which is connected by vertical flue to outside of casing, providing for a continual limited flow of air through the cylinder; allowing no cold air to enter combustion chamber through the feed door, which is made blank instead of with draft slide.

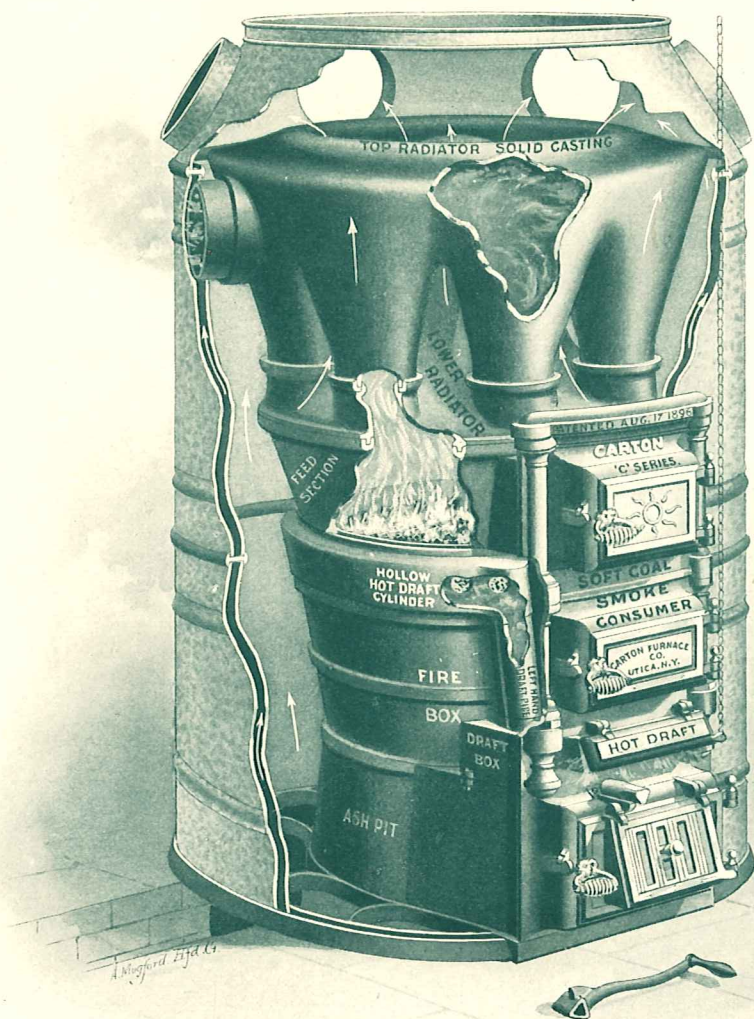
The Ash Pits

Are made of liberal depth, allowing of sufficient air space underneath the grates to prevent them from warping.

Seven Sizes, Portable.

Designating Number, "C" Series.	List Price, Castings, F. O. B. Utica.	Double Castings, F. O. B. Utica, Net.	Diameter of Fire Pot, Inside, Inches.	Diameter of Casing, Inches.	Diameter of Radiator, Inches.	Diameter of Smoke Pipe, Inches.	Height of Castings, Inches.	Capacity. Number of Pipes of Average Size.
00236	\$216.00	\$8.00	20	36	31	8	52½	4 to 5
00240	243.00	9.00	22	40	34	8	54	5 to 7
00242	291.00	10.00	24	42	36	8	57	6 to 8
00246	338.00	11.00	26	46	39	9	62	7 to 9
00252	422.00	12.00	28	52	45	9	69½	9 to 11
00256	544.00	14.00	30	56	49	10	72½	10 to 12
00260	703.00	16.00	33	60	52	10	76½	12 to 15

See table, page 39.



"C" Series
Carton Furnace.

*Smoke Consumer.
 Soft Coal.
 Portable.*

Expansion and Contraction.

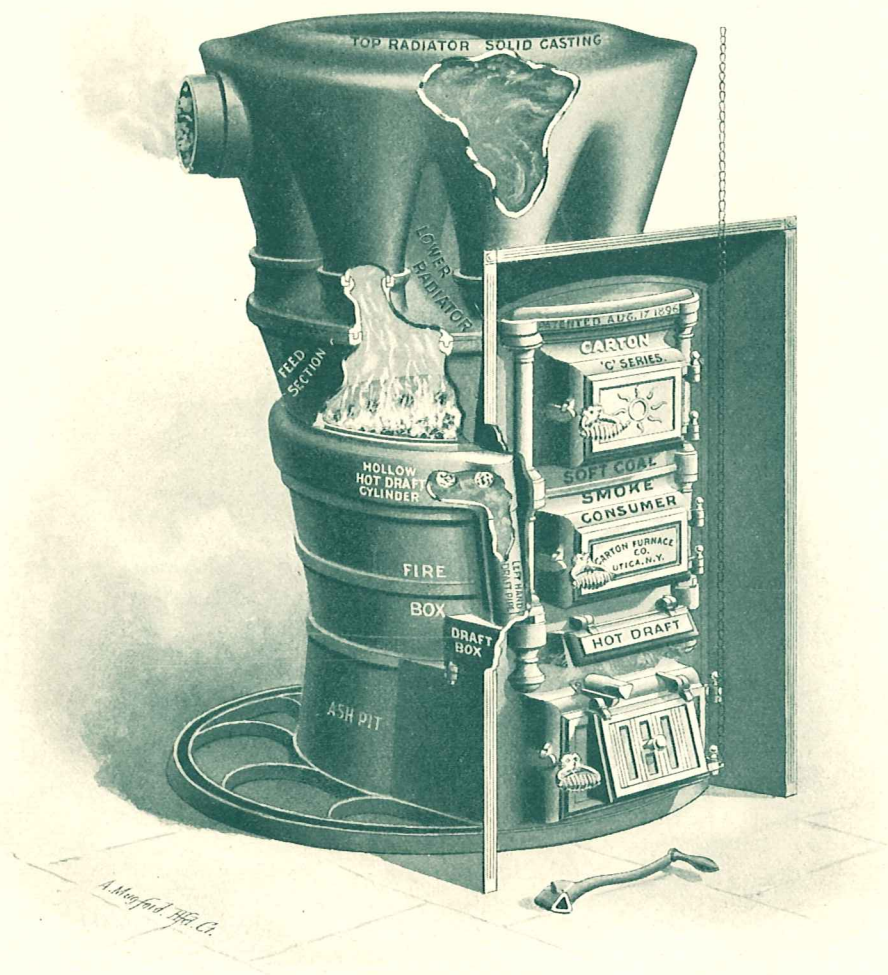
Careful provision has been made in this heater to provide for expansion and contraction of this hollow, hot-draft cylinder. It is made in a single piece, entirely independent of the feed section or fire pot, and so constructed as to withstand the most severe tests it has been put to. For soft coal fuel several commendable features in this heater cannot be emphasized too emphatically, to wit: The large combustion chamber, a very important factor in a soft coal heater. The vertical combustion flues, allowing of no soot pockets, and the intense heat of the combustion passing vertically up these flues, thereby burning off any accumulation that may adhere to the sides of vertical flues under slow combustion.

These two special features alone establish its superiority as a soft coal heater, but, in connection with these, this heater has an extremely large combustion chamber, a most vital point in burning soft coal fuel, on account of the large amount of gases and smoke generated. The radiators are self-cleaning, and need no clean-out doors. The castings are made solid; no bolts used.

Seven Sizes, Brick Set.

Designating Number, "C" Series.	List Price, Castings, F. O. B. Utca.	Covering Bars, Per Set, Net.	Trench Plates, Per Set, Net.	Diameter of Fire Pot, Inside, Inches.	Diameter of Radiator, Inches.	Diameter of Smoke Pipe, Inches.	Height of Castings, Inches.	Capacity, Number of Pipes of Average Size.
00236	\$226.00	\$2.75	\$2.25	20	31	8	52½	4 to 5
00240	253.00	3.00	2.50	22	34	8	54	5 to 7
00242	306.00	3.00	2.50	24	36	8	57	6 to 8
00246	353.00	4.00	2.75	26	39	9	62	7 to 9
00252	442.00	4.00	3.00	28	45	9	69½	9 to 11
00256	564.00	5.00	4.00	30	49	10	72½	10 to 12
00260	728.00	6.00	5.00	33	52	10	76½	12 to 15

See table, page 39.



"C" Series
Carton Furnace.

Smoke Consumer.
 Soft Coal.
 Brick Set.

Carton "D" Series

Solid Cast Iron Return Flue Radiator Furnace.

A heavy, solid, all cast-iron furnace, very economical and extremely low in height, insuring good elevation to the hot air pipes. The body of this furnace is heavily corrugated. Up to the top of the fire pot this furnace embodies the same features as described in our Carton "A" to "C" Series, the same grate, handsome ornamental shield front, sectional fire pot, etc.

The Feed Section

Is made solid; bottom of mouthpiece is not bolted. Its shape is such that an exceptionally large air space is provided for between the inner wall of the radiator and the gas dome, insuring a large volume of warm air.

The Radiator

Is constructed solid and of cast iron, and the vertical sides are nearly parallel, giving liberal flue capacity without decreasing air space, as noted above. In this series, for hard coal fuel there is a "division plate" on the left side of flue from gas dome, thereby compelling the products of combustion to travel the entire circumference of the radiator before entering the smoke pipe attached to the collar on the opposite side of the "division plate," extracting all the units of heat possible from the fuel consumed.

The Gas Dome

Is integral,—made a part of the radiator,—and no bolts are used where the connecting flue unites the two. The gas dome and radiator are one solid piece. The direct fire surface of this gas dome is exceptionally large. Appreciating the value of such radiation, we have, in the construction of the same, added largely to the power of this furnace.

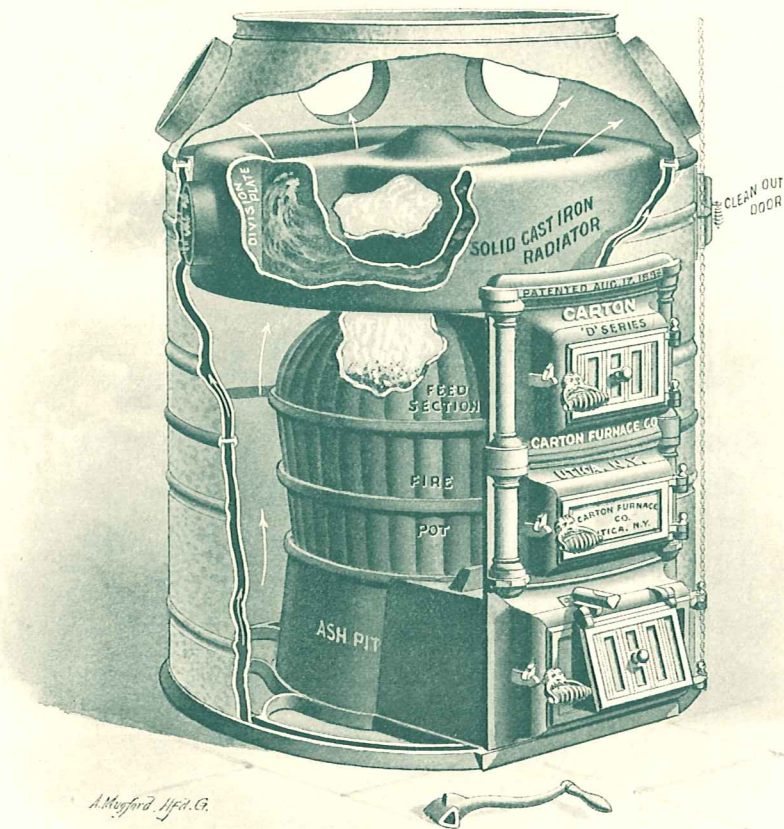
The Ash Pits

Are of ample depth to provide for sufficient air space under grates.

Six Sizes, Portable.

Designating Number, "D" Series.	List Price, Castings, F. O. B. Utica.	Double Castings, F. O. B. Utica, Net.	Diameter of Fire Pot, Inside. Inches.	Diameter of Casing, Inches.	Diameter of Radiator, Inches.	Diameter of Smoke Pipe, Inches.	Height of Castings, Inches.	Capacity. Number of Pipes of Average Size.
932	\$138.00	\$6.00	18	32	27	7	44½	3 to 4
936	159.00	7.00	20	36	31	7	44½	4 to 5
940	203.00	8.00	22	40	35	7	49	5 to 7
942	220.00	9.00	24	42	37	7	49	6 to 8
946	262.00	11.00	26	46	41	8	52	7 to 9
952	335.00	13.00	29	52	47	8	55	10 to 12

See table, page 39.

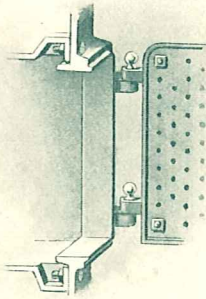


**"D" Series
Carton Furnace.**

**Solid Cast Iron.
Return Flue Radiator.
Portable.
Hard Coal.**

Doors.

The sectional illustration below shows the feed door boltings and expansion flange on frame, used on this furnace.



There are four bolts used, one in each corner; this binds the door firmly to the feed section and removes any possibility of the door becoming loose, and thereby causing escape of gas on the inside of the top of the frame, when furnace draft is checked.

The expansion flange on the feed door frame provides for expansion of feed door, and prevents any leakage of the gases.

The door always fits perfectly in this construction. The doors and frames form a handsome design shield front, very simply set up. No bolts are used in attaching this shield front to casing, but a perfectly tight connection is made by the casing being set tight between the door frames and mouthpieces of castings.

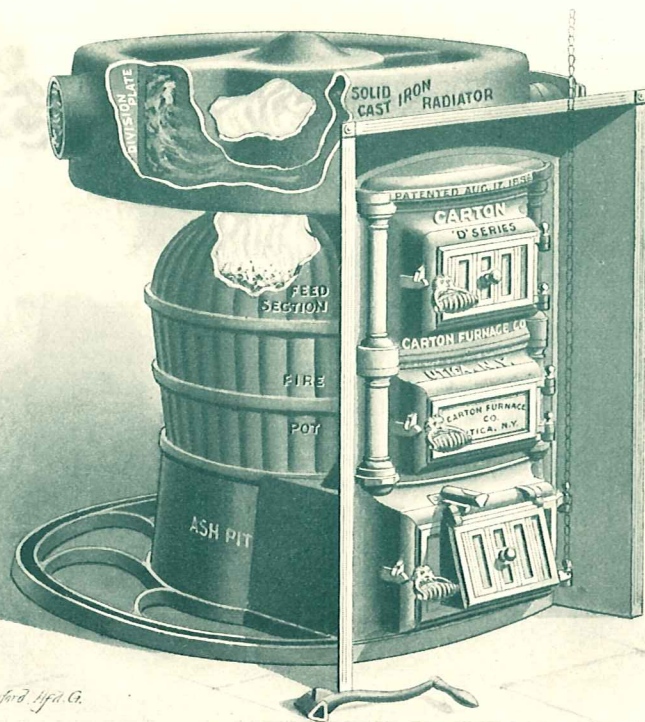
The Height of Castings

Of this furnace is very low, and the radiating surface being brought low down, gives excellent elevation to the hot air pipes. The large combustion chamber, as readily seen, on account of formation of feed section and large gas dome, is a point of merit.

Five Sizes, Brick Set.

Designating Number, "D" Series.	List Price, Castings, F. O. B. Utica.	Covering Bars, Per Set, Net.	Trench Plates, Per Set, Net.	Diameter of Fire Pot, Inside, Inches.	Diameter of Radiator, Inches.	Diameter of Smoke Pipe, Inches.	Height of Castings, Inches.	Capacity. Number of Pipes of Average Size.
936	\$169.00	\$2.75	\$2.25	20	31	7	44½	4 to 5
940	218.00	3.00	2.50	22	35	7	49	5 to 7
942	235.00	3.00	2.50	24	37	7	49	6 to 8
946	282.00	4.00	2.75	26	41	8	52	7 to 9
952	355.00	5.00	3.00	29	47	8	55	10 to 12

See table, page 39.



"D" Series
Carton Furnace.

Solid Cast Iron.
Return Flue Radiator.
Brick Set.
Hard Coal.

Carton "E" Series

Solid Cast Iron Radiator Soft Coal Furnace.

This heater, for soft coal fuel, embodies the very essential requisite of being constructed of all cast iron. Its general construction is largely similar to our Carton "D" series, retaining all the valuable features of this series, and the general description is the same as that of the Carton "D" series.

The Radiator

Is constructed solid, and of all cast iron, with its vertical side walls nearly parallel. The flue capacity is very liberal. The travel of the combustion in the radiator from the gas dome flue is divided, the smoke pipe collar being in the rear, directly opposite the mouth of the gas dome flue. In this division of the combustion in this way for soft coal fuel the travel to smoke pipe is more direct, thereby doubling the flue capacity, the advantage of which can readily be appreciated.

The Combustion Chamber

In this series has been carefully considered, as has been emphasized in the preceding series. Owing to the large volume of gases in consuming soft coal, a large gas mixing combustion chamber is an absolute necessity, and in the construction of the feed section and the gas dome this vital point has been provided for.

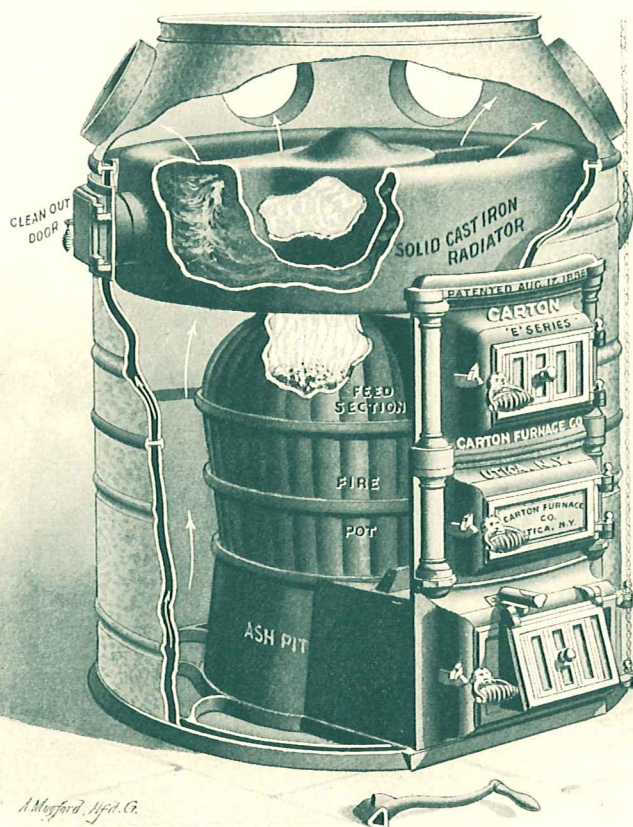
The Doors.

The system of bolting and the expansion flange are the same as described and illustrated on page 18. The handsome shield front is easily set up, forming a tight connection with the casing, without any boltings at its outer edges.

Six Sizes, Portable.

Designating Number, "E" Series.	List Price, Castings, F. O. B. Utica.	Double Casings, F. O. B. Utica, Net.	Diameter of Fire Pot, Inside. Inches.	Diameter of Casing, Inches.	Diameter of Radiator, Inches.	Diameter of Smoke Pipe, Inches.	Height of Castings, Inches.	Capacity. Number of Pipes of Average Size.
0932	\$138.00	\$6.00	18	32	27	7	44½	3 to 4
0936	159.00	7.00	20	36	31	8	44½	4 to 5
0940	203.00	8.00	22	40	35	8	49	5 to 7
0942	220.00	9.00	24	42	37	8	49	6 to 8
0946	262.00	11.00	26	46	41	9	52	7 to 9
0952	335.00	13.00	29	52	47	9	55	10 to 12

See table, page 39.



**"E" Series
Carton Furnace.**

**Solid Cast Iron Radiator.
Portable.
Soft Coal.**

The Gas Dome

Is integral,—made a part of the radiator,—made in one solid piece, and its size is such that it represents a large amount of direct fire surface, the value of which cannot be emphasized too emphatically.

The Radiating Surface

Is all compact, and brought low down on the fire, making it sharp, quick and effective.

The Height of Castings

Is also an advantage, insuring good elevation of the hot air pipes.

The Air Space

Between the gas dome and feed section is very liberally provided for, insuring a large volume of warm air.

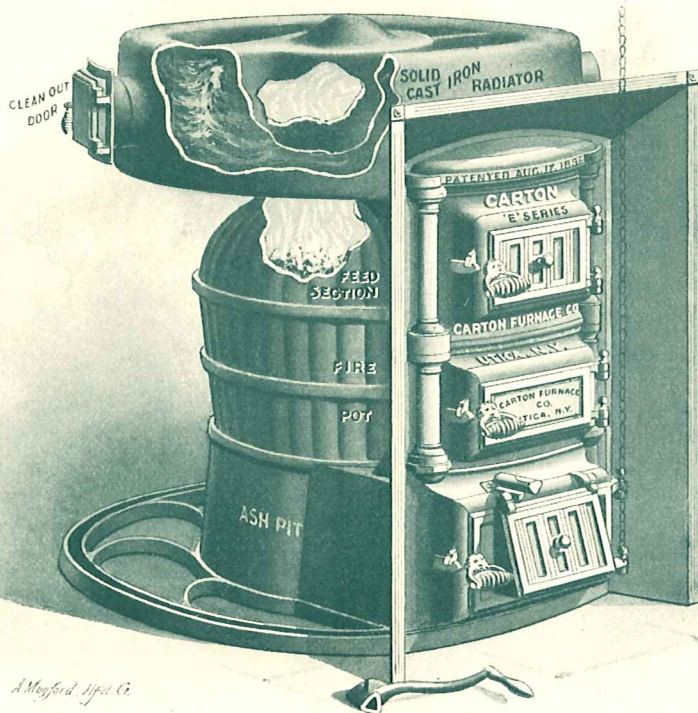
The Ash Pits

Are deep, which affords protection to the life of the grates.

Five Sizes, Brick Set.

Designating Number, "E" Series.	List Price, Castings, F. O. B. Utica.	Covering Bars, Per Set, Net.	Trench Plates, Per Set, Net.	Diameter of Fire Pot, Inside. Inches.	Diameter of Radiator. Inches.	Diameter of Smoke Pipe. Inches.	Height of Castings. Inches.	Capacity. Number of Pipes of Average Size.
0936	\$169.00	\$2.75	\$2.25	20	31	8	44½	4 to 5
0940	218.00	3.00	2.50	22	35	8	49	5 to 7
0942	235.00	3.00	2.50	24	37	8	49	6 to 8
0946	282.00	4.00	2.75	26	41	9	52	7 to 9
0952	355.00	5.00	3.00	29	47	9	55	10 to 12

See table, page 39.



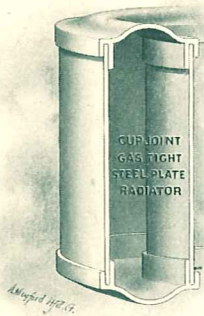
"E" Series
Carton Furnace.

*Solid Cast Iron Radiator.
 Brick Set.
 Soft Coal.*

Carton "F" Series

Steel Plate Return Flue Radiator Furnace.

A quick and effective heater. A thoroughly high-grade furnace that will give universal satisfaction. Low in height and its surface very compact. It differs only in construction to the Carton "A" to "C" Series, inclusive, above the fire pot; same grate, ornamental shield front, sectional fire pot, etc.



A Perfectly Tight Radiator Joint

Is used in this furnace, as shown in sectional cut, in which will be noticed a deep flange on the inside of top and bottom radiator decks, with a smaller flange on the outside, forming a perfect cup joint in which the steel plate is imbedded in asbestos cement packing. The steel plate cannot come away from either of these deck plates, and yet ample provision is allowed for expansion and contraction. This joint has withstood very severe tests and remained perfectly tight.

The Large Gas Dome

Is a particular feature of this furnace in adding to the capacity of the size of the combustion chamber, and also materially increasing the power of the furnace by giving additional radiating surface. This gas dome is a solid casting made in one piece without a bolted bottom, and where the flue bolts to the steel plate radiator there are provided heavy cast-iron flanges, to protect the edges of the steel from the intense heat of the combustion when the furnace is fired hard.

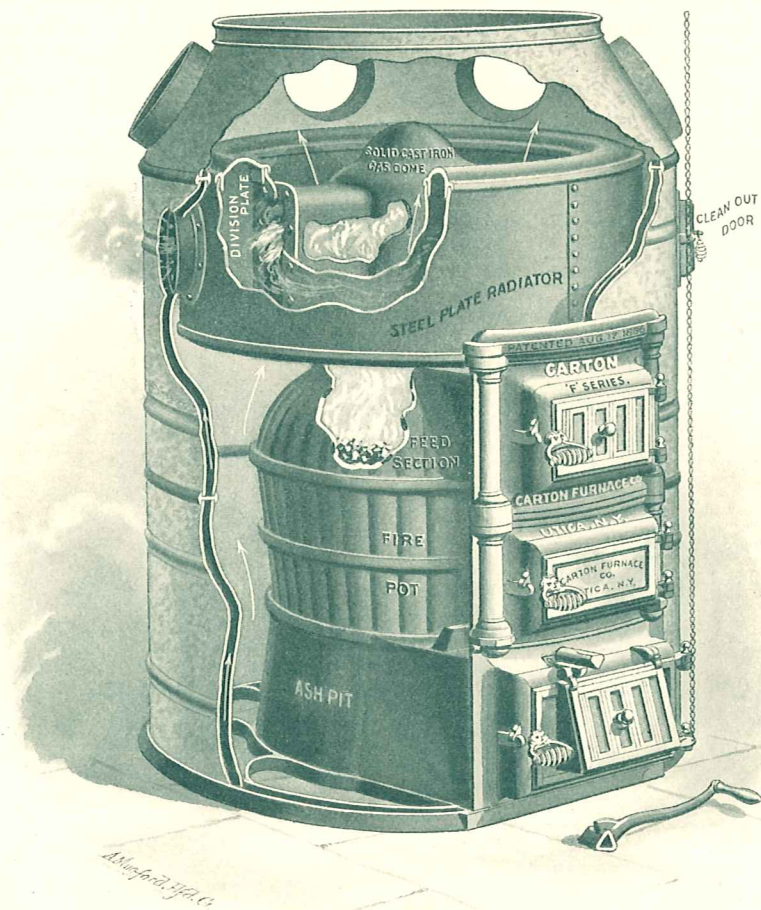
Deep Ash Pits

Are provided in all the sizes.

Six Sizes, Portable.

Designating Number, "F" Series.	List Price, Castings, F. O. B. Utica.	Double Castings, F. O. B. Utica, Net.	Diameter of Fire Pot, Inside. Inches.	Diameter of Casing. Inches.	Diameter of Radiator. Inches.	Diameter of Smoke Pipe. Inches.	Height of Castings. Inches.	Capacity. Number of Pipes of Average Size.
832	\$133.00	\$6.00	18	32	27½	7	48	3 to 4
836	153.00	7.00	20	36	31½	7	48	4 to 5
840	193.00	8.00	22	40	34½	7	52½	5 to 7
842	213.00	9.00	24	42	37½	7	52½	6 to 8
846	253.00	11.00	26	46	41½	8	56	7 to 9
852	326.00	13.00	29	52	47½	8	59	10 to 12

See table, page 39.



"F" Series
Carton Furnace.
 Steel Plate Return Flue Radiator.
 Portable.
 Hard Coal.

The Radiator

Is constructed with a "division plate" on the left of the gas dome flue, which compels the combustion to travel the entire circumference of the radiator before entering the smoke pipe, on the opposite side of the "division plate." The diameter of the radiator is such, in connection with the form of the feed section, that an exceptionally large air space is provided between the inner wall of radiator and the gas dome.

The Bolting of the Doors

Is the same as shown by illustration and description on page 18 of our Carton "D" Series.

The Height of the Castings

Being so low is an advantage for particularly low cellars.

The Radiating Surface

Is all compact; brought low down on the fire and a liberal percentage is direct fire surface.

The Cup Joints

Are all on the outside of the furnace; the inside surfaces are all smooth; combustion does not come in contact with them.

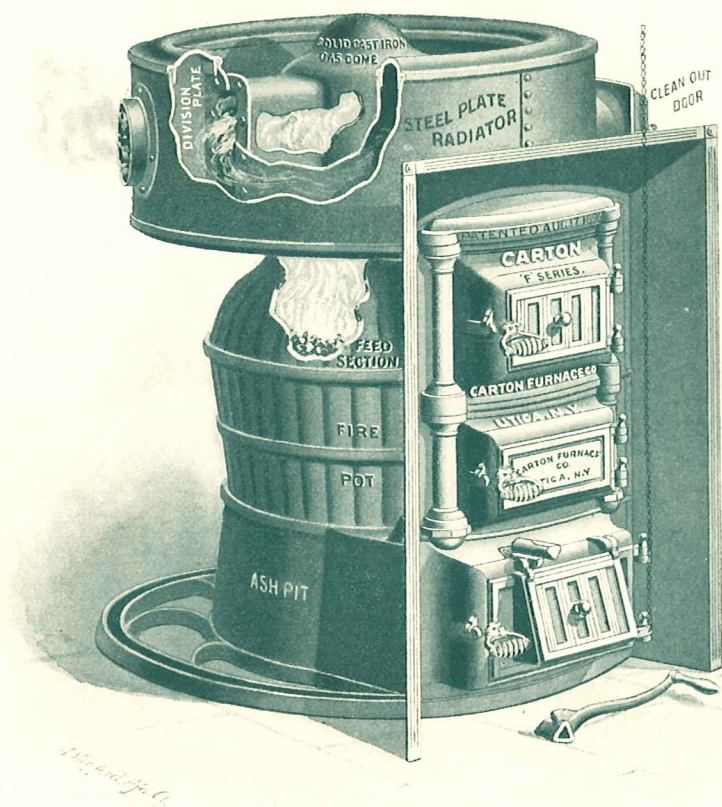
The Form of the Parts

Is such as to insure the greatest strength and resistance.

Five Sizes, Brick Set.

Designating Number, "F" Series.	List Price, Castings, F. O. B. Utica.	Covering Bars, Per Set, Net.	Trench Plates, Per Set, Net.	Diameter of Fire Pot, Inside. Inches.	Diameter of Radiator. Inches.	Diameter of Smoke Pipe. Inches.	Height of Castings. Inches.	Capacity. Number of Pipes of Average Size.
836	\$163.00	\$2.75	\$2.25	20	31 1/2	7	48	4 to 5
840	208.00	3.00	2.50	22	34 1/2	7	52 1/2	5 to 7
842	228.00	3.00	2.50	24	37 1/2	7	52 1/2	6 to 8
846	273.00	4.00	2.75	26	41 1/2	8	56	7 to 9
852	346.00	5.00	3.00	29	47 1/2	8	59	10 to 12

See table, page 39.

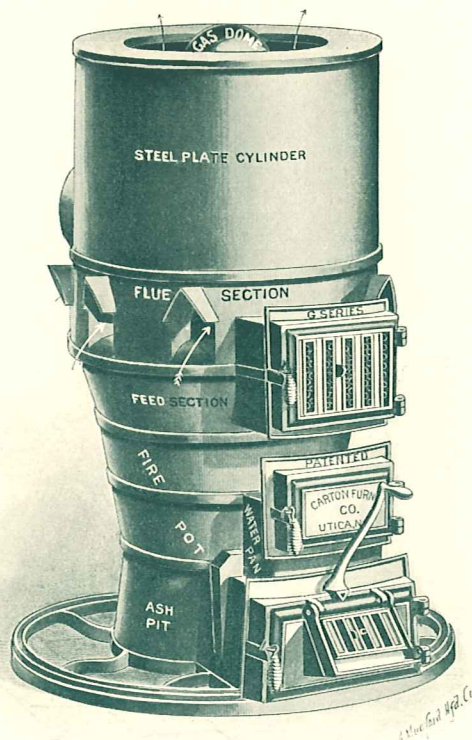


**"F" Series
Carton Furnace.**

**Steel Plate Return Flue Radiator.
Brick Set.
Hard Coal.**

Carton "G" Series

Hard Coal Steel Plate Radiator Furnace.



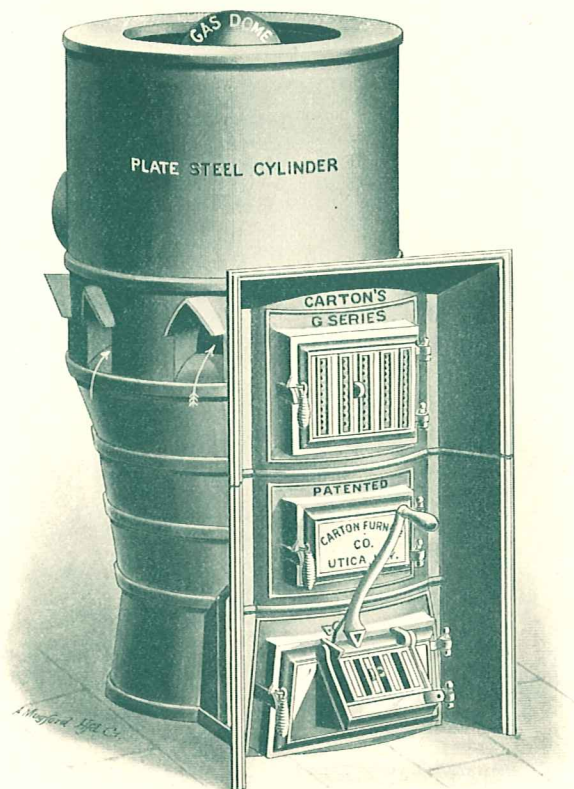
Four Sizes, Portable.

Designating Number, "G" Series.	List Price, Castings, F. O. B. Utica.	Double Casings, F. O. B. Utica, Net.	Diameter of Fire Pot, Inside. Inches.	Diameter of Casing. Inches.	Diameter of Smoke Pipe. Inches.	Height of Castings. Inches.	Capacity. Number of Pipes of Average Size.
123	\$240.00	\$9.00	23	40	7	61	5 to 7
133	300.00	11.00	26	46	7	62	7 to 9
139	366.00	13.00	28	54	8	68	9 to 11
149	650.00	18.00	36	60	9	78	12 to 18

See table, page 39.

Carton "G" Series

Hard Coal Steel Plate Radiator Furnace.



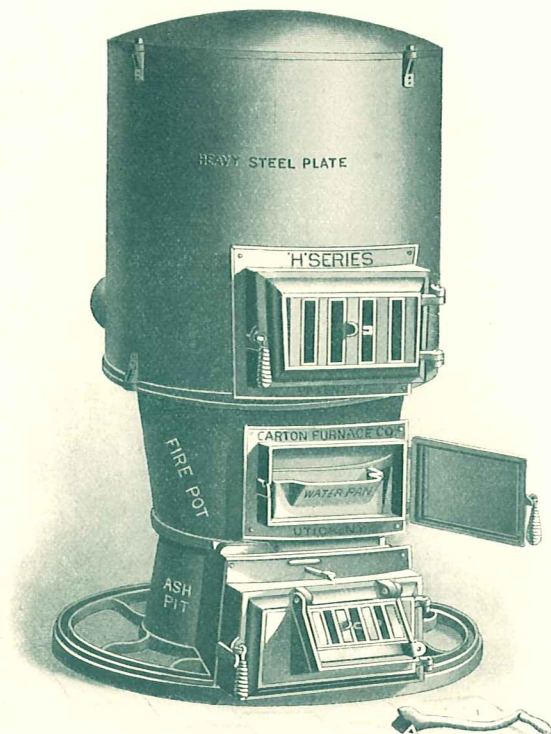
Four Sizes, Brick Set.

Designating Number, "G" Series.	List Price, Castings, F. O. B. Utica.	Covering Bars, Per Set, Net.	Trench Plates, Per Set, Net.	Diameter of Fire Pot, Inside. Inches.	Diameter of Smoke Pipe. Inches.	Height of Castings. Inches.	Capacity. Number of Pipes of Average Size.
123	\$255.00	\$3.00	\$2.50	23	7	61	5 to 7
133	320.00	4.00	2.75	26	7	62	7 to 9
139	386.00	4.00	3.00	28	8	68	9 to 11
149	675.00	6.00	5.00	36	9	78	12 to 18

See table, page 39.

Carton "H" Series

Hard Coal and Wood Steel Dome Furnace.



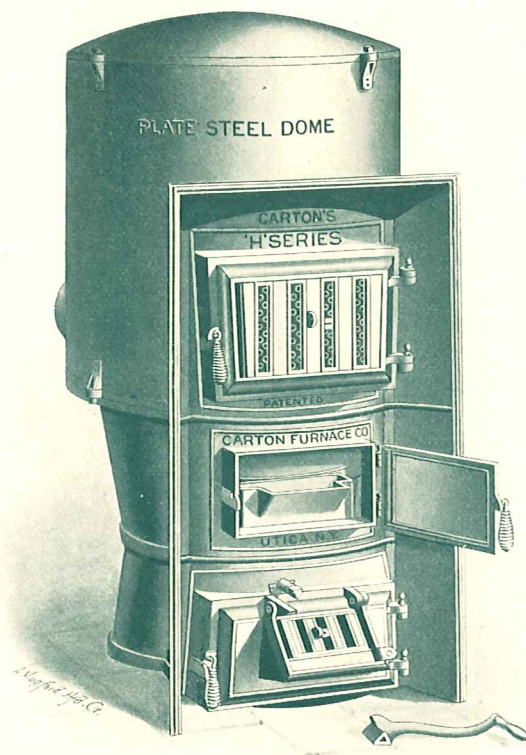
Nine Sizes, Portable.

Designating Number, "H" Series.	List Price, Castings, F. O. B. Utica.	Double Casings, F.O.B. Utica, Net.	Diameter of Fire Pot. Inches.	Diameter of Casing. Inches.	Diameter of Dome. Inches.	Diameter of Smoke Pipe. Inches.	Height of Castings. Inches.	Capacity. Number of Pipes of Average Size.
41	\$72.00	\$5.50 ^{**}	16	28	20 $\frac{3}{4}$	6	47 $\frac{1}{2}$	2 to 3
42	89.00	5.75	18	30	23	7	48 $\frac{1}{2}$	2 to 4
43	97.00	6.00	18	32	23	7	48 $\frac{1}{2}$	2 to 4
44	111.00	6.50	20	34	27 $\frac{1}{4}$	7	48 $\frac{1}{2}$	3 to 4
45	115.00	7.00	20	36	27 $\frac{1}{4}$	7	48 $\frac{1}{2}$	3 to 4
45 $\frac{1}{2}$	138.00	8.00	22	40	27 $\frac{1}{4}$	7	52 $\frac{1}{2}$	4 to 6
46	165.00	9.00	24	42	28 $\frac{3}{4}$	8	54 $\frac{1}{2}$	5 to 7
47	197.00	10.00	26	46	31 $\frac{3}{4}$	8	57	6 to 8
48	266.00	12.00	31	54	40	9	64	8 to 10
* Single Casings. With Large Feeder Doors—For Wood Fuel.								
046	175.00	9.00	24	42	28 $\frac{3}{4}$	8	54 $\frac{1}{2}$	5 to 7
047	204.00	10.00	26	46	31 $\frac{3}{4}$	8	57	6 to 8

See table, page 39.

Carton "H" Series

Hard Coal and Wood Steel Dome Furnace.



Six Sizes, Brick Set.

Designating Number, "H" Series.	List Price, Castings, F. O. B. Utica.	Covering Bars, Per Set, Net.	Trench Plates, Per Set, Net.	Diameter of Fire Pot, Inside, Inches.	Diameter of Dome, Inches.	Diameter of Smoke Pipe, Inches.	Height of Castings, Inches.	Capacity. Number of Pipes of Average Size.
44	\$121.00	\$2.75	\$2.25	20	27 $\frac{1}{4}$	7	48 $\frac{1}{2}$	3 to 4
45	125.00	2.75	2.25	20	27 $\frac{1}{4}$	7	48 $\frac{1}{2}$	3 to 4
45 $\frac{1}{2}$	153.00	3.00	2.50	22	27 $\frac{1}{4}$	7	52 $\frac{1}{2}$	4 to 6
46	180.00	3.00	2.50	24	28 $\frac{3}{4}$	8	54 $\frac{1}{2}$	5 to 7
47	217.00	4.00	2.75	26	31 $\frac{3}{4}$	8	57	6 to 8
48	286.00	5.00	4.00	31	40	9	64	8 to 10

See table, page 39.

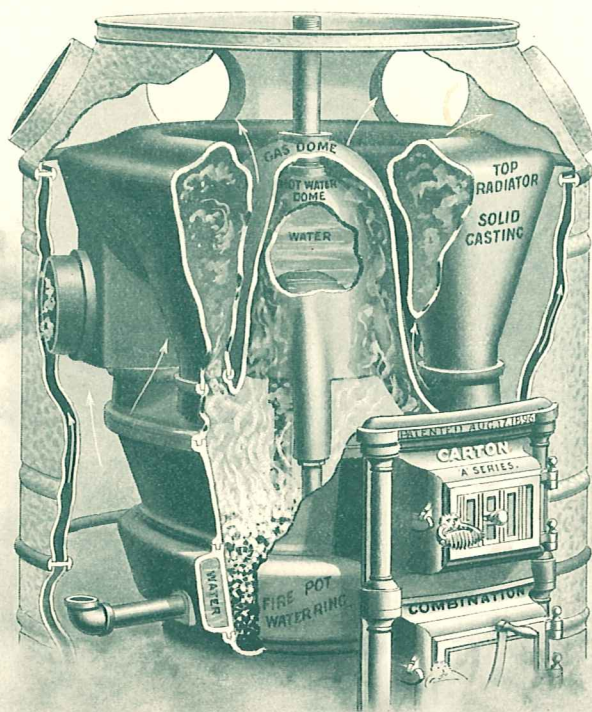
Carton

Combination Hot Water and Hot Air Heater.

With Water Ring and Dome Combined.

This boiler can be used in our "A," "B" or "C" Series, and is to meet the requirements of a combination system, where a larger amount of water radiation is required than in the ordinary combination plant.

This illustration shows the boiler as applied in the Carton "A" Series.

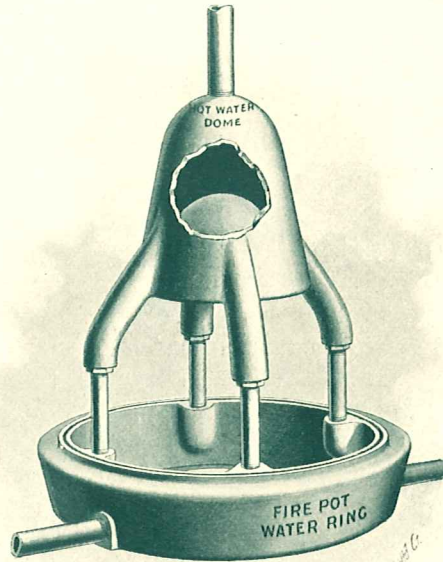


As will be seen by the illustration the boiler is not complicated. The water enters on either side of the water ring, thence vertically through the four vertical waterways connecting the water dome.

Where the flow pipe passes through the gas dome, double cup expansion rings are provided which make a gas tight connection.

The circulation of the water, it will be noticed, is all vertical, being unobstructed by cross currents.

The boiler surface is all strictly the best of fire surface, and the water ring always being in the hottest part of the fire, the circulation is very rapid under ordinary firing and particularly quick when the heater is run under slow combustion.



The boiler parts are solid, and proper provision is made for expansion and contraction.

Every boiler tested under cold water pressure before shipment.
It is the most powerful combination on the market.

Carton Combination Boiler, Ring and Dome.

To fit Fire Pots of Following Diameters in "A," "B" and "C" Series. Inches.	List Price, Castings, F. O. B. Utica.	Flow Tapping.	Return Tappings.	Square Feet of Direct Radiation Boilers will carry with Connecting Pipes Covered.
22	\$95.00	1 2-inch	2 1½-inch	200
26	112.00	1 2½-inch	2 2-inch	275
28	135.00	1 3-inch	2 2½-inch	350
30	145.00	1 3-inch	2 2½-inch	400

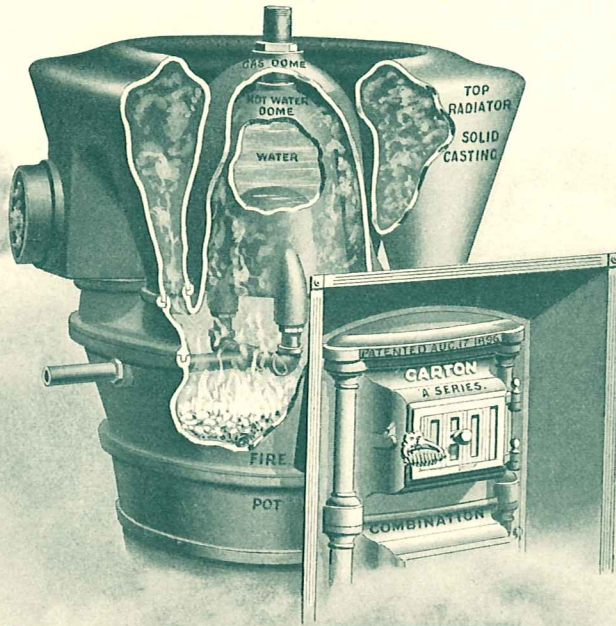
NOTICE.—To arrive at the proper size of Heater required, deduct 50 per cent. from the hot air capacity of the Furnace that this Boiler is to be placed in.

Carton

Combination Hot Water and Hot Air Heater.

With Water Dome Boiler.

This boiler can be used in our "A," "B," "C," "D," "E," "F," and "H" Series, and is to meet the requirements of a combination system, where it is difficult to reach and properly warm rooms with hot air. This illustration shows the boiler as applied in the Carton "A" Series.

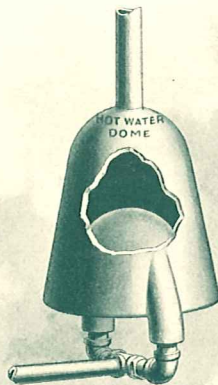


This dome boiler is suspended directly over the fire; its surface is all direct fire surface of the most efficient character, and the circulation of the water is particularly quick.

The return water enters in the T-fitting, in the cross arm, at the bottom of the boiler, and is carried through the feed section, which

opening is made tight by cast-iron washers and lock-nuts, which we can furnish when ordered.

The boiler is hung from the top of gas dome by washer and lock-nut and made perfectly tight.



The circulation is strictly vertical; no cross currents or horizontal circulation; no loss from friction.

Every inch is direct heating surface.

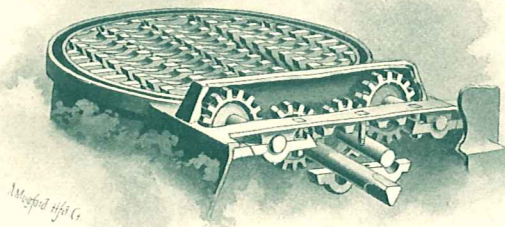
Carton Dome Boiler.

Designated by Diameter of Boiler. Inches.	List Price, Castings, F. O. B. Utica.	Flow Tapping.	Return Tapping.	Height of Boiler. Inches.	Square Feet of Direct Radiation Boiler will carry with Connecting Pipes Covered.
14	\$31.00	1 2-inch	1 2-inch	15	100
18	46.00	1 2 1/2-inch	1 2 1/2-inch	15	150
20	53.00	1 3-inch	1 3-inch	16	175

Carton

Triangular Revolving Grate.

Absolutely no dust with this grate. The only grate free of clinker. Only a child's power to operate. No sifting of ashes necessary. The coal entirely consumed. The most economical and durable. Three distinct grate surfaces used in alternation. The entire contents of the fire pot can be removed in one-third the time required to dump any other grate.



This Grate

Is composed of four, and in the larger sizes five, triangular bars, entirely independent of each other, and any one of the bars can be replaced without having to purchase an entire new grate.

The Construction

Of the bars being triangular gives this grate two cooling surfaces in the ash pit; to the ordinary grates one, and in the revolution of the grates three distinct surfaces in alternation are exposed to the fire, preventing the grate from warping.

The grates are hung in the ash pit in the rear in deep circular openings, large enough to allow for expansion and contraction, and in the front they are held in position by three grate rests being attached to the top of the ash pit by machine bolts which are countersunk.

These three grate rests are so arranged, by the center one being dove-tailed into the two side grate rests, that either side grate can be replaced without even disturbing the other grate bars, and the pair of

middle grates, or either of these grates, can be replaced without disturbing the other bars.

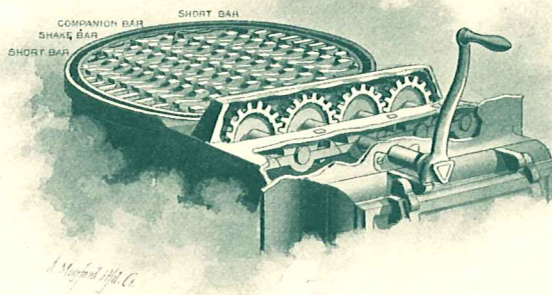
The opening in the ash pit door frame, to provide for the shaker bar, is arranged by means of a dove-tailed cleat, which does not necessitate disturbing the ash pit door frame when replacing the shaker bar.

The Cogs.

The grates revolve by cog-wheels attached to the grate bars, and their position being in front of the ash pit they are away from the fire and easily gotten at.

The Lever Handle.

The grate is operated by a lever handle with a stop attached, which leaves the grate in proper position after turning, and one can operate this grate in the dark.



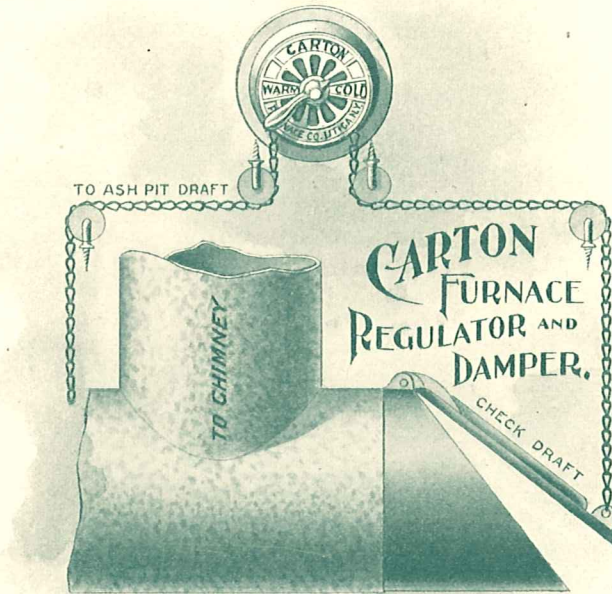
In operating this grate the furnace doors are all closed, making no dust, and the sections being triangular in form and turning simultaneously by means of the cogs, they present three grate surfaces alternately.

A simple turning of the lever handle absolutely clears the fire surface of all ashes and refuse, leaving every square inch of the grate surface equally bright and clear, and without packing down the coal in a solid mass, allowing of free circulation of air through the coal, insuring perfect combustion and enabling more heat to be obtained from a given quantity of fuel than ever before known.

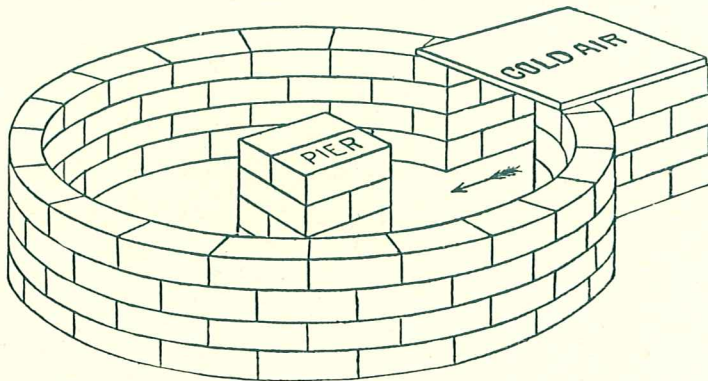
All other anti-clinker, shaking and agitating grates by their motion pack the coals tightly together, making it impossible with the ordinary draft to obtain perfect combustion.

Carton

Regulating Damper and Attachments.



For regulating and controlling drafts of furnaces.
 Drafts can be attended to from above—overcoming the necessity of going down cellar when more or less fire draft is required.
 These attachments are furnished with our furnaces when ordered.



Showing formation and construction of foundation and pit of a portable furnace.

The cold air supply can also be taken in on a level with the base ring of the furnace, when it is advisable to do so, and in such case the connection should not be over 10 to 12 inches in height, depending upon the size of the furnace.

To Determine Size of Hot Air Pipes.

While the size of hot air pipe that will be required to heat a room will largely depend upon the existing conditions, that vary in different buildings, to wit, proportion of exposed wall and glass surface, length of pipe and construction of building, there must, nevertheless, be some relation to the cubical contents of same, and, therefore, as the simplest and most readily comprehended rule of apportioning the size of hot air pipes we offer the following table, which is based on the building being detached, of average construction and exposure, average length of pipes and the outside temperature zero. In case of extraordinary conditions, such as poor construction of building, location of building, exceptional exposure of wall surface, unusual glass exposure, loose windows and doors and long hot air pipes, allowances must be made, and the ratio of size of hot air pipes to cubical contents must be increased proportionally over that stated in this table.

One Square Inch of Capacity of Hot-Air Pipe Will Heat Cubic Feet of Space as Follows:

<i>Dwellings.</i>	<i>Each Inch Will Heat</i>
Living rooms, one side exposed.....	23 cubic feet.
Living rooms, two sides exposed.....	20 " "
*Sleeping rooms, one side exposed.....	35 " "
*Sleeping rooms, two sides exposed.....	25 " "
Halls.....	35 " "
*Bath rooms, size 8 by 12 by 9 feet or over (smaller sizes 8-inch pipe).....	18 " "
<i>Public Buildings.</i>	
Stores (where furnace is connected to one pipe directly over same).....	50 " "
Churches (where furnace is connected to one pipe directly over same).....	90 " "

* If located on the second story, the vertical partition pipes or stacks can be about 25 per cent. less in capacity than the round cellar connecting pipe to said partition pipe, on account of increased velocity of hot air in the vertical pipe.

Example.

In explanation of the above table we give the following example, to wit: To heat a living room, first floor, with two side wall surfaces exposed, size 15 by 15 by 10 feet ceiling, equaling 2,250 cubic feet, at a ratio of one to twenty, the size of the hot air pipe required to heat this room is arrived at by dividing 2,250 by 20, equaling 112½, which is the equivalent of a 12-inch pipe of 113 cubic inches.

(Table of capacities of pipes on page 48.)

Rules for Setting and Piping.

The proper location for a furnace, as well as the sizes and distribution of the warm air conducting pipes from the furnace is one of the most important requisites for its successful operation. (See table, page 39.)

The furnace should always be so placed as to have the warm air pipes as near of a length as possible. But when more exposure exists from the prevailing winds, generally north or west, that side should be favored by placing the furnace nearer it than to the warmer side, and by increasing the size of the warm air pipes.

At the point of location selected, obtain the center, and indicate the same on the ceiling, for convenience. If cold air is taken in under the base, as shown by engravings on page 38, from a point on the cellar bottom under the center point marked on the ceiling, form a circle about this center and dig a pit in this circle, the diameter of the same, after the sides of pit are lined with brick, to equal the inside diameter of the base ring, that it may rest on this foundation, and the depth of the pit, after the bottom is lined with brick, to be in the clear from twelve to sixteen inches, according to size of furnace.

Leave opening, and build brick-lined trench of proper size, depending on size of furnace and number and size of warm air pipes, in the back of pit to meet cold air duct. Better results are obtained when cold air is taken in at the rear of the furnace rather than at the sides. For portable furnace, in large sizes, build 12-inch pier in center of pit to support the base. (See sketch on page 38.)

Lay foundation of one course of brick, the top of the same to be flush with the cellar bottom and the top of brick pit, and make dimensions equal to those of the square wall around the furnace, that both circular and square walls may rest on this foundation.

Commence circular wall by laying a course of brick, following the circle of the base ring, thus forming the circle for the circular wall. Carry the circular wall to the height of the top of the ash pit, then place the trench plates by resting them on headers extended into the chamber from the circular wall, and place them so that the next course of brick will lap over an inch on the outside edge of the trench plates, to hold them securely. At this point leave opening for manhole door, which we advise at the back of the furnace. Carry circular wall to the top of radiator, laying wall tube for smoke pipe, and having diameter of the same three inches larger than smoke pipe. Put adjustable collar around the smoke pipe on outside of square wall.

At this point, set warm air pipes in circular wall, so that the tops of pipes will be on a level, regardless of size, and that the bottom of the largest pipe will not come below the upper line of the top radiator. Continue circular wall to one course of brick above the top of warm air pipes. The hot air chamber should be at least 12 inches higher than

the radiator. Hot air pipes should be conducted from the highest point of the inner wall or hot air chamber, from which point there should be a gradual rise to the registers or connections. When the hot air pipes are set in position, carry up the walls (building in the pipes carefully) to the level of the top edge of the pipes; then lay on the covering bars parallel with front and rear walls; place tin between the bars to cover the entire hot air chamber; then cover the whole structure with two courses of brick (breaking joints) well laid in mortar. Leave no dirt or mortar on the castings or in the hot air chamber, when finished.

Before connecting smoke pipe with chimney, examine it thoroughly, test the draft, see that there are no obstructions in it, such as brick, mortar, or accumulated soot. A furnace to work perfectly must have a clear, unobstructed draft. (See table, page 43.) Be sure the smoke pipe is fitted tightly where it connects with flue and collar on the radiator. In all cases when it is necessary to place a smoke pipe or hot air pipe, particularly the former, close to any portion of the woodwork of a building, great care should be taken that such woodwork be properly covered with tin, and a suitable space left for the circulation of air around it.

Care should be taken in setting up the castings, to see that the face surfaces of mouthpieces of the feed section and ash pit are plumb.

If cold air is taken in on a level with the ash pit, lay foundation of one course of brick flush with cellar bottom, and leave opening for cold air, of sufficient size, in the rear of furnace through the circular and square walls.

Whitewash inside of circular wall and top of warm air chamber. We furnish kaolin cement for cementing all the joints, and a can of asbestos cement to be used in attaching the door frames to the furnace.

Use the kaolin cement on all the joints excepting the doors, regulating damper and smoke pipe, and on these joints use the asbestos cement in the can. Wet the kaolin cement with water, and thoroughly work same to the thickness of mortar before using, care to be taken that it is free from lumps.

Trim the edges of the warm air pipes flush with the inside of the circular wall. The circular and square walls should each be four inches or one course of brick thick.

Make the space between the outer square wall and the circular wall four (4) inches at the narrowest point.

In setting up castings, be very particular that the same are perfectly level, and thoroughly cement the joints.

We suggest as a safe rule to follow in the construction of the cold-air box, where outside air is used, to make the capacity of same equal to two-thirds of the capacity of the warm air pipes. The cold air will expand one-third in becoming warm, in passing the furnace.

If soft coal is used, the cold air supply should be increased.

Where inside air is used, the cold air box should have a capacity about equal to the full capacity of the warm air pipes.

Outside cold air should be introduced from the north or west side of the building, and the opening protected with wire cloth of about

one-quarter inch mesh. It should be provided with a trap, which in extreme cold weather, or when the fire is low, can be partially closed.

In churches or public buildings where but a single register is required, take the hot air pipe from the top of the furnace, and use grating without valves.

The above suggestions refer to portable form of setting as well as to the brick-set form.

Where the pipes are taken from the sides, the upper edges should all be on a level with each other where they are attached to the furnace, whatever may be their size, and, in all cases, enter as closely under the inner covering of the furnace as possible, always securing as much elevation as possible, that the heat may be more effectually secured.

The only power that moves the warm air through the pipes from the furnace is that caused through the tendency of heated air to rise; hence, horizontal pipes do not draw. There must be some elevation, and if there is but little elevation to the pipes for a number of feet, the movement of air is necessarily very slow. On the other hand, perpendicular pipes draw well and stronger as they have greater height.

We recommend and advise taking warm air pipes out of top, where height of cellar will permit, more particularly when portable.

Make the pipes with as few turns or elbows as possible from the furnace to the registers, and, if necessary to make turns, the elbows should not be at sharp angles.

In all cases where pipes are carried above the first floor, use a damper in the hot air pipes one foot from the furnace, and keep it closed when the heat is not required in that apartment, as it is not economy to shut the heat off at the register, leaving the pipe constantly filled with hot air, which would radiate its heat in the cellar or walls in which it is located.

Hot air pipes should not be placed in outside walls. Hot air pipes can be placed in an ordinary joist partition, but they must, in such cases, be lined or covered. Closets also afford a convenient avenue for pipes. The connection between the register and the pipe is made by a tin register box, which is of a form to fit the pipe on one side and to receive the register on the other side.

It is sometimes necessary to heat two (2) rooms with one warm air pipe and two (2) registers, in which case a double register box is used, made of sufficient depth to leave a space between the two (2) registers equal to the full size of the pipe that supplies these registers; also, the same space should be provided for in all register boxes, whether for one or more registers.

When several registers are used for one furnace, care should be taken to have at least one of these constantly open when the furnace is in use.

Important !

We call particular attention to table of size of warm air pipes on page 39.

Chimney Flues.

Hints to Architects and Builders.

Chimney Flues for Heating Apparatus should be ample in size, and carried as straight as possible from a point near the cellar floor to above the highest projection of the roof. They should be independent, having no connection with other flues or openings, and always of the same area from top to bottom. A well jointed tile flue, preferably round, is better than a square brick flue of larger area. The chimney flue should be carried 3 or 4 feet below the smoke pipe entrance and provided with a clean-out door at the base, tightly fitted, affording easy access for removing the accumulated dust and soot.

*The Size of Flues may be Calculated from the
Following Table :*

Total Contents of Building. Cubic Feet of Space.	Tile Flues, Standard Sizes, Square or Rectangular. Outside Dimensions, Inches.	Tile Flues, Standard Sizes, Round. Inside Dimensions, Inches.	Brick Flues. Inside Dimensions, Inches.
10,000 to 20,000	8½ x 8½	8	8 x 8
25,000 to 50,000	8½ x 13	10	8 x 12
60,000 to 100,000	13 x 13	12	12 x 12
100,000 to 150,000	18 x 18	16	16 x 16

No chimney flue should be less than 8 inches in depth.

Ventilating Flues should be provided for in original plans. They should be located in inside walls, and in proximity to chimney flues when possible, deriving therefrom the necessary heat to secure an upward movement of the currents. The opening in these flues should be at the bottom.

The areas of vent flues should be about 1 square inch to every 20 cubic feet of space.

Directions for Operating the Carton Furnaces.

Preparatory to starting a fire put shaving or paper on grates and cover with kindling wood. Immediately before starting fire light shavings or paper in the smoke pipe to overcome dampness in the chimney flue and create good draft. After kindling has become ignited, put on some more, and then put on the coal, and after the first fuel has become well ignited put on another supply of coal, leaving the drafts on until the gas has burned off. When fire is first started allow full draft on the smoke pipe, but allow only a little draft through the ash pit door damper, until the large volume of smoke and gas has been carried away, when ash pit door draft can be increased. Close check draft slide in feed door when fire is lighted, afterward opening it; this slide should always be opened after replenishing the fire with coal, and when fire has burned up it should be closed about one-half. To increase fire open draft in ash-pit door and close check draft in smoke pipe, and to check fire *vice versa*.

Before operating grate, always close all drafts in ash-pit door and also close check draft in smoke pipe. Also be careful to arrange drafts in this way before opening feed door to put on coal, to prevent the gas coming into cellar out of feed door opening while door remains open. Turn grates a sufficient number of times from right to left until there is a bright grate surface. In turning grates, if a piece of slate, stone, or other obstruction gets wedged between teeth of grates, do not try to force the grates over, but reverse the motion and the obstruction will drop through into ash pit. Be sure to keep the fire pot full of coal in both mild and cold weather; fill the fire pot perfectly full every time the furnace is attended to. A large body of coal can be controlled but a small body will die out, under slow combustion, and thereby wasting fuel in this way. The fuel will be perfectly consumed and no sifting of ashes necessary if these directions are followed. Do not under any conditions use large size coal; this is very important. (See special instructions on the "coal question" on page 45.) The ashes should always be removed from ash pit. Never allow them to accumulate under the grates, which will insure the grate not warping or burning out. Also be very particular to leave the grates in proper position after operating them; each of the three flat surfaces, of all of the bars to remain in a like position, the points hanging in the ash pit; otherwise the grates will warp or burn out. Set drafts depending upon the temperature outside so as to maintain a steady, even fire, instead of continually closing and opening them; this will insure the best results and economy of fuel.

The furnace smoke pipe and opening where smoke pipe enters chimney flue should invariably be cleaned once a year, immediately after fire is discontinued in the spring, to prevent the soot accumulating moisture and causing corrosion. It is a good rule to rub tallow around all the surfaces of the doors where they close on the door frames, also on the door frames in a like manner, which will prevent corrosion during

summer and the doors will remain perfectly fitted. The trap in the cold air box must be regulated as necessity requires. With a strong head-wind on the face of the box, the trap should be partially closed, as the conditions require, to prevent too rapid flow of air into hot air chamber.

If drafts of furnace are closed off tight at night, the trap of cold air box should also be closed. This trap in cold air box should be so constructed that when its capacity is closed from the outside, the same capacity remains from the inside. Inside cold air boxes require no regulating or attention. Remember that all hot air pipes do not work equal and the same, owing to different conditions, but in using a little judgment by favoring the unfavorable pipes, a satisfactory result will be effected. The dampers in the pipes can be turned, to equalize the flow of warm air. In case a room has been shut up, becoming cold with register closed, do not expect an immediate flow of warm air upon opening the register, as the cold air in room is heavy, preventing the warm air coming up the register. In such a case open the door leading into warm adjoining room, and temporarily close other registers, forcing air into this pipe. When it becomes warm the air will commence to flow, and when the temperature of room is changed the other registers can be opened, and the air will continue to flow through this pipe. During the operation of the furnace never close all the registers at one time; always leave one open as a vent for the hot air from the furnace. A little common sense in the care of a furnace will obviate a great deal of annoyance, and the lack of it causes general dissatisfaction.

Important ! The Coal Question.

The question of the quality and the size of the coal is of vital importance, and a great deal of annoyance would be overcome if this question should receive the attention it should by the users of furnaces. The coal dealer will invariably fill an order for coal with "egg" size or what is still worse what is termed "furnace coal," whereas the proper size for furnaces up to and including fire pots 26 inches in diameter is "stove" size, and all sizes larger "stove" size and "small egg coal," half and half. The larger sizes are only fit for blast furnaces, where strong pressure blast is required to burn it. Do not use these larger sizes under any conditions; they are not adapted to house-heating purposes. In the majority of cases, where people complain of the amount of coal consumed (in any furnace), the cause is usually owing to the size and quality of the coal. Under ordinary firing, with these large sizes of coal, the fire will die out around the sides, and what is ignited will only be partially consumed, causing a waste of the fuel; the fire cannot be controlled and it will need constant attention. Dealers giving their customers the above advice will enable them to get the best results in heating.

Sizes of Casings.

"A" and "B" Series.

Numbers.	Width of Galvanized Outside and Black Iron Inside.			Length of Galvanized Outside, 1-inch Lap Included.	Length of Black Inside, 1-inch Lap Included.
	Lower Section. Inches.	Middle Section. Inches.	Upper Section. Inches.		
236 and 0236	21 $\frac{7}{8}$		26	9 ft. 6 in.	8 ft. 11 $\frac{3}{4}$ in.
240 and 0240	23 $\frac{1}{4}$		28	10 ft. 6 $\frac{1}{2}$ in.	9 ft. 11 in.
242 and 0242	23		30	11 ft. $\frac{3}{4}$ in.	10 ft. 5 in.
246 and 0246	23 $\frac{3}{4}$		32	12 ft. 1 $\frac{1}{4}$ in.	11 ft. 6 $\frac{1}{2}$ in.
252 and 0252	27		34	13 ft. 8 $\frac{1}{2}$ in.	13 ft. 1 $\frac{1}{4}$ in.
256 and 0256	26 $\frac{7}{8}$	18	20	14 ft. 8 in.	14 ft. 1 $\frac{1}{4}$ in.
260 and 0260	29 $\frac{1}{4}$	18 $\frac{5}{8}$	22	15 ft. 8 $\frac{3}{4}$ in.	15 ft.

"C" Series.

Number.	Width of Galvanized Outside and Black Iron Inside.			Length of Galvanized Outside, 1-inch Lap Included.	Length of Black Inside, 1-inch Lap Included.
	Lower Section. Inches.	Middle Section. Inches.	Upper Section. Inches.		
00236	26		26	9 ft. 6 in.	8 ft. 11 $\frac{3}{4}$ in.
00240	27 $\frac{1}{4}$		28	10 ft. 6 $\frac{1}{2}$ in.	9 ft. 11 in.
00242	27 $\frac{3}{8}$		30	11 ft. $\frac{3}{4}$ in.	10 ft. 5 in.
00246	27 $\frac{1}{4}$		32	12 ft. 1 $\frac{1}{4}$ in.	11 ft. 6 $\frac{1}{2}$ in.
00252	31 $\frac{5}{8}$		34	13 ft. 8 $\frac{1}{2}$ in.	13 ft. 1 $\frac{1}{4}$ in.
00256	31 $\frac{1}{2}$	18	20	14 ft. 8 in.	14 ft. 1 $\frac{1}{4}$ in.
00260	34	18 $\frac{5}{8}$	22	15 ft. 8 $\frac{3}{4}$ in.	15 ft.

"D" and "E" Series.

Numbers.	Width of Galvanized Outside and Black Iron Inside.		Length of Galvanized Outside, 1-inch Lap Included.	Length of Black Inside, 1-inch Lap Included.
	Lower Section. Inches.	Upper Section. Inches.		
932 and 0932	21 $\frac{1}{4}$	22	8 ft. 5 $\frac{1}{2}$ in.	7 ft. 11 in.
936 and 0936	21 $\frac{7}{8}$	24	9 ft. 6 $\frac{1}{4}$ in.	9 ft.
940 and 0940	23 $\frac{1}{4}$	26	10 ft. 6 $\frac{1}{4}$ in.	9 ft. 11 in.
942 and 0942	23	26	11 ft. $\frac{3}{4}$ in.	10 ft. 5 in.
946 and 0946	23 $\frac{1}{4}$	28	12 ft. 1 in.	11 ft. 6 $\frac{3}{4}$ in.
952 and 0952	24 $\frac{3}{4}$	30	13 ft. 8 $\frac{3}{4}$ in.	13 ft. 1 $\frac{1}{2}$ in.

Sizes of Casings.

"F" Series.

Number.	Width of Galvanized Outside and Black Iron Inside.		Length of Galvanized Outside, 1-inch Lap Included.	Length of Black Inside, 1-inch Lap Included.
	Lower Section. Inches.	Upper Section. Inches.		
832	21 $\frac{1}{4}$	24	8 ft. 5 $\frac{1}{2}$ in.	7 ft. 11 in.
836	21 $\frac{7}{8}$	24	9 ft. 6 $\frac{1}{4}$ in.	9 ft.
840	23 $\frac{1}{4}$	28	10 ft. 6 $\frac{1}{4}$ in.	9 ft. 11 in.
842	23	28	11 ft. 3 $\frac{3}{4}$ in.	10 ft. 5 in.
846	23 $\frac{1}{4}$	30	12 ft. 1 in.	11 ft. 6 $\frac{3}{4}$ in.
852	24 $\frac{3}{4}$	32	13 ft. 8 $\frac{3}{4}$ in.	13 ft. 1 $\frac{1}{2}$ in.

"H" Series.

Number.	Width of Galvanized Outside and Black Iron Inside.		Length of Galvanized Outside, 1-inch Lap Included.	Length of Black Inside, 1 inch Lap Included.
	Lower Section. Inches.	Upper Section. Inches.		
41	22	24	7 ft. 5 in.	
42	22	26	7 ft. 11 $\frac{1}{2}$ in.	7 ft. 5 in.
43	21 $\frac{3}{8}$	26	8 ft. 5 $\frac{1}{2}$ in.	7 ft. 11 in.
44	20 $\frac{1}{2}$	26	9 ft.	8 ft. 5 $\frac{1}{2}$ in.
45	21	28	9 ft. 6 $\frac{1}{4}$ in.	9 ft.
45 $\frac{1}{2}$	22	28	10 ft. 6 $\frac{1}{4}$ in.	9 ft. 11 in.
46	24	28	11 ft. 3 $\frac{3}{4}$ in.	10 ft. 5 in.
47	24	28	12 ft. 1 in.	11 ft. 6 $\frac{1}{2}$ in.
48	28	30	14 ft. 3 in.	13 ft. 8 in.
046	24	28	11 ft. 3 $\frac{3}{4}$ in.	10 ft. 5 in.
047	24	28	12 ft. 1 in.	11 ft. 6 $\frac{1}{2}$ in.

Table of Estimated Capacity of Pipes and Registers.

Round Pipes.

Diameter of Pipe. Inches.	Area in Square Inches.	Diameter of Pipe. Inches.	Area in Square Inches.	Diameter of Pipe. Inches.	Area in Square Inches.
7	38	12	113	22	380
8	50	14	154	24	452
9	63	16	201	26	531
10	78	18	254	28	616
11	95	20	314	30	707

Registers.

Size of Opening. Inches.	Capacity in Square Inches.	Size of Opening. Inches.	Capacity in Square Inches.	Size of Opening. Inches.	Capacity in Square Inches.
6 x 10	40	10 x 14	93	20 x 20	267
8 x 10	53	10 x 16	107	20 x 24	320
8 x 12	64	12 x 15	120	20 x 26	347
8 x 15	80	12 x 19	152	21 x 29	400
9 x 12	72	14 x 22	205	27 x 27	486
9 x 14	84	15 x 25	250	27 x 38	684
10 x 12	80	16 x 24	256	30 x 30	600

Round Registers.

Size of Opening. Inches.	Capacity in Square Inches.	Size of Opening. Inches.	Capacity in Square Inches.	Size of Opening. Inches.	Capacity in Square Inches.
7	26	12	75	20	209
8	33	14	103	24	301
9	42	16	134	30	471
10	52	18	169	36	679
				48	1,000

*We Manufacture a Full and Complete Line of
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